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Visual Resource Study Plan for the Proposed Northern Tier Pipeline Route Through Montana

September 1978

The Montana Energy and MHD Research and Development Institute, Inc.

Post Office Box 3809
Butte, Montana 59701

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Visual Resource Study Plan for the Proposed Northern Tier Pipeline Routes Through Montana

September 1978

PROPOSAL

Prepared by

Socioeconomic Division
The Montana Energy and MHD Research and Development Institute
P.O. Box 3809
Butte, Montana 59701

September 1978

Prepared for

State of Montana
Department of Natural Resources and Conservation

PROPOSAL SUBMITTED TO THE
MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

VISUAL RESOURCE STUDY PLAN FOR THE PROPOSED NORTHERN TIER PIPELINE ROUTES THROUGH MONTANA

APPLICANT

The Montana Energy and MHD
Research and Development Institute
P.O. Box 3809
Butte, Montana 59701
Phone: 494-6100

PROJECT MANAGER

Mitriann Popovich
The Montana Energy and MHD
Research and Development Institute
P.O. Box 3809
Butte, Montana 59701
Phone: 494-6346

PROJECT SCOPE

Project consists of a visual resources assessment of proposed alternative Northern Tier Pipeline routes through the state of Montana. The visual assessment will be accomplished by review of existing data, maps, and on-site visits if necessary. Adverse impacts and mitigating measures will also be reported.

PUBLIC INFORMATION ACKNOWLEDGEMENT

In the event this proposal is funded, it is agreed that all resulting information may be made available to the public. In addition, it is agreed that all information contained in this application is public, and the applicant hereby waivers any claim to confidentiality.

ABSTRACT

The Montana Energy and MHD Research and Development Institute (MERDI) hereby proposes to conduct the Visual Resource Study portion for the Montana Department of Natural Resources and Conservation of the proposed Northern Tier Pipeline Project. The subject portion of this project will involve a descriptive analysis of the visual impact of the proposed pipeline construction. This will be accomplished by reviewing existing data, personal contacts, analyzing topographic maps, and on-site visits if necessary.

BACKGROUND

The Montana Energy and MHD Research and Development Institute (MERDI) has qualified personnel with expertise in a broad range of technical areas including marketing and finance, social impact assessments, survey techniques, economic modeling and forecasting, and environmental impact assessments. An interdisciplinary team approach, access to Lockheed, Orbit, and SBC computer reference sources, a familiarity with existing studies that deal with projects similar to the Northern Tier Pipeline (NTP), contact with various federal, state, and local agencies, and MERDI's central Montana location are resources essential to the accomplishment of the proposed environmental assessment.

MERDI's past and present contracts include a study of the feasibility and environmental impact of siting energy facilities at Glasgow Air Force Base, Montana. The Glasgow project includes an analysis of other re-use scenarios for Glasgow Air Force Base (GAFB) and a determination of possible impacts. Baseline characteristics and environmental conditions of the area were established. Solar and wind energy systems were evaluated for their applicability to the area, and an economic analysis of the systems is being conducted. Presently, an environmental impact assessment is being prepared for review and recommendations by the U.S. Department of Defense. A screening process dealing with the environmental, economic, and social impacts of siting energy facilities also has been completed by MERDI's environmental and socioeconomic personnel.

Two of MERDI's contracts involve systems engineering in support of the U.S. Department of Energy's (DOE) magnetohydrodynamics (MHD) program. One division of MERDI is providing support for the construction, testing, utilization, and management of the Component Development and Integration Facility (CDIF), a prototype MHD facility being built near Butte, Montana. MERDI's

Socioeconomic Division is collecting and monitoring baseline information on social impacts, economic impacts, and changes in values and attitudes that are a result of the CDIF operation; monitoring of these parameters will continue after operations begin.

MERDI, in collaboration with Energy and Environmental Analysis, wrote the Environmental Development Plan (EDP) for the MHD program in 1977 and 1978. MHD pollutants are expected to be the same as those from other direct combustion processes, and the EDP identifies areas of concern for future research. The EDP will be used as a reference document on the environmental engineering and socioeconomic issues raised as MHD development continues.

The Institute conducted a study on the feasibility of heating the Montana State Hospital at Warm Springs from geothermal sources in the area. MERDI was involved in developing a conceptual design study which collected data on the energy demand of the facility and explored the feasibility of utilizing the hot springs to satisfy the demand.

Work also has been conducted on treatment, storage, and disposal of hazardous waste materials. One study included evaluating and analyzing existing state permit systems, and another was directed specifically at CDIF-generated waste products.

MERDI has access to the Montana Interlibrary Loan System and the Pacific Northwest Bibliographic Center in addition to a fine technical library of its own. An access to regional sources of information, a familiarity with Montana ecosystems and land use patterns, an interdisciplinary team approach, successful technical and environmental assessment and contracting, and qualified personnel make MERDI an exceptionally viable candidate to conduct the proposed Northern Tier Pipeline (NTP) environmental assessment.

Program Management

The Project Manager will have full responsibility for the proposed project including cost, performance, and schedule controls. However, he will be accountable for the project to the Socioeconomic Division Manager. She, in turn, will convey project progress, achievements, and problem areas to the Deputy Director for Technology.

The Project Manager will be required to submit weekly status reports (covering progress, schedule variations, problem areas, and potential solutions) to the Socioeconomic Division Manager. Monthly meetings will be held with all MERDI Deputy Directors, Division and Project Managers, and the Deputy Managing Director to ensure that all organizational elements within MERDI are aware of ongoing, potential, and completed projects.

Each project within MERDI is assigned a charge number. Any charges allotted to a specific charge number first must be approved by the requestor's division manager.

Financial reports are furnished to the appropriate contracting agency in accordance with contract specifications. Technical progress is reported as specified by the contracting agency or when unexpected achievements or problems occur.

Organizational charts for MERDI, the Socioeconomic Division, and this project are appended to this proposal. Resumes of key personnel are appended.

TECHNICAL DISCUSSION

A. Description

The visual environment accounts for a very large percentage of man's perception of his outdoor surroundings. The National Environmental Policy Act of 1969 provides for the accounting of changes to the visual environment. The Montana Environmental Policy Act also provides for this accounting by stating that "the state may assure for all Montanans safe, healthful, productive, and a esthetically and culturally pleasing surroundings" {69-6502(2)}. The Montana Environmental Policy Act further states that "the state shall utilize a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences and the environmental design acts in planning and in decision-making which may have an impact on man's environment" {69-6504 (b)(1)}. Therefore, a general format is established for the assessment of the visual resource study plan of the visual impact for the DNRC proposal.

For this project, assessments of visual impact for the proposed primary corridor and each alternative route, including in each case the pump station locations, will be required. The approach will be to assess the visual impact of the proposed pipeline in the following areas.

1. High Visual Impact

   Areas of the routes where the pipeline might have a high visual impact such as wilderness areas, scenic rivers, and historical sites.

   Areas which have been selected for pump station locations which might have a high visual impact such as wilderness areas, scenic rivers, and historical sites, also their proximity to major roads or highways. Because transmission lines to the pump station will be required from nearby power sources, the visual impact of these transmission lines will also be assessed.

2. Medium Visual Impact

Areas of the proposed route as it passes under or near good fishing streams and forests will be assessed also. The location of the pump stations as they relate to these same areas will be examined.

3. Low Impact

Because much of the pipeline will be buried there should be little visual impact. If pump stations are located near urban areas where visual expectations would be lower, the impact would be less than if the station was located on the bank of a remote fishing stream. The same would hold true if the stream or river crossing for the pipeline was located at a bridge site where it could be blended into the present construction as opposed to a pipe newly lying across a small stream or river.

There will be a greater visual impact during the construction phase of this project. Because of the nature of the project, such as the pipeline being buried, this visual impact will be lessened. The pump station locations will have a greater impact on visual perceptions. Therefore these areas will receive greater emphasis for the visual assessment. As it will be necessary for transmission lines to be placed from existing power facilities to the pump stations, a thorough examination of these locations and the impact on the visual characteristics of the surrounding area will be made.

The effect which new developments might have on the visual quality of the land depends largely on the amount of visual contact which is created because of new development and the existing visual environment. As a result, the assessment model will analyze the visual characteristics of the proposed construction development and compare them to the existing visual characteristics of the environment, resulting in the development of the impact of the construction

of the pipeline. The assessment of the visual impact using this approach will be a good indicator of the severity of the impact as well as serving as a guide in determining mitigating measures. This process is similar to procedures used by the federal Forest Service and BLM in determining visual impacts within their respective areas.

The objective is to develop a description of the visual characteristics of the present environment. This will be done in sufficient detail to allow for assessment and analysis of the visual impacts of the proposed construction. The site location of the pump station will be scrutinized as these above ground facilities are more likely to have a greater visual impact on the surrounding environment than the buried pipeline and its swath through the state.

B. Method

The greatest possible use of existing information will be made in the description of the existing visual environment. A review of existing data in the following seven areas will be made:

		Source
1.	Land use patterns,	DNR,BLM
2.	Population patterns,	BOC,BBER
3.	Vegetation patterns,	DRN,BLM,SCS
4.	Terrain,	DRN,BLM,FS
5.	Transportation routes,	DH
6.	Areas of scenic concern, and	DNR,BLM,FS
7.	Location of visual characteristics of the proposed primary corridor and alternate routes.	DNR,BLM,FS

This information will be thoroughly reviewed and analyzed at which time the information will be integrated to describe the existing visual

character of the environment. Maps, graphics, text, and tables will be used in the description of the results.

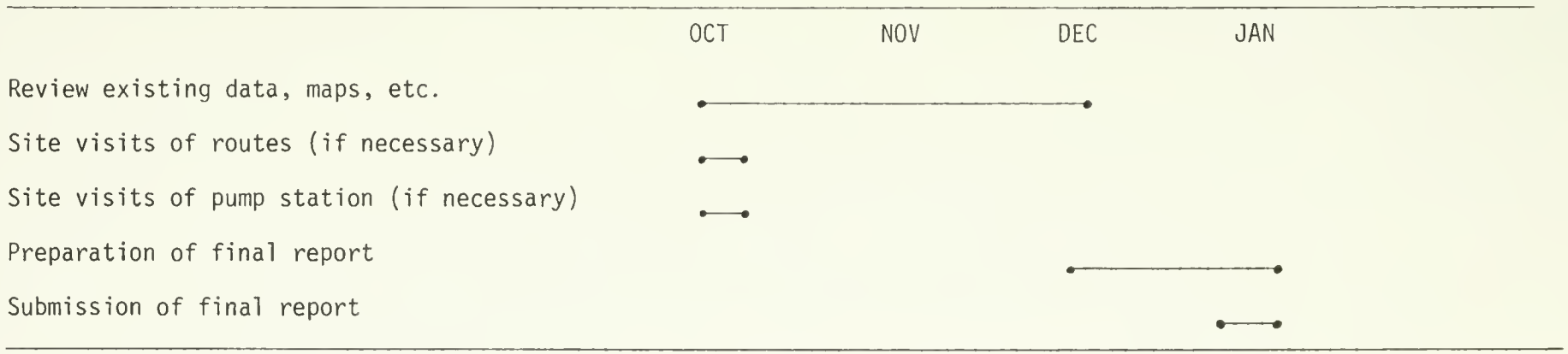
C. Visual Impacts of Proposed Construction

In this section the objective is to conduct a systematic and analytical assessment of the visual impact of the proposed primary corridor and the alternate routes. The focus will be on the major significant impacts, whereas minor impacts will be delt with in less detail.

The analysis will involve the magnitude, intensity, duration, and incidence of the visual impact of the proposed project within the study areas.

This section will also deal with the site specific details as they relate to the pump stations.

MILESTONE CHART FOR THE VISUAL RESOURCE STUDY PLAN



APPENDIX

Resumes

TERENCE G. KIRKLAND — Deputy Director for Technology

Experienced in the management of engineering research and development companies including 17 years in industry and 14 years in government.

EXPERIENCE

5/78 to present	Deputy Director for Technology for the Montana Energy and MHD Research and Development Institute in Butte, Montana. Responsible for administering and coordinating the activities of five divisions: Applied Research, Environmental, Socioeconomics, Engineering, and Computer Support. Responsible for the technical personnel and financial management of these divisions to accomplish the scientific and contractual tasks of the Institute.
3/77 to 4/78	Assistant to the Chief of Engineers for Research and Development and Chief, Research and Development Office, Corps of Engineers, Washington, D.C. Exercised directive authority over the Commanders/Directors of the Corps-wide laboratories and technical supervision of the Corps of Engineer division and district laboratories to ensure optimum utilization of research and development resources under all applicable appropriations.
9/73 to 3/77	Technical Director of U.S. Mobility Equipment Research and Development Center (MERDC), Fort Belvoir, Virginia. Responsible for planning, organizing, directing and controlling the technical programs of the Center and is the principal technical advisor for the Center and the Army Materiel Command in the research, development, and engineering of assigned items of equipment for combat use.
5/71 to 9/73	Chief, Countermine/Counter Intrusion Department, MERDC. Responsible for technical planning of and direction of 178 scientists, technicians, and administrators in conduct of research, exploratory, advanced, and engineering development and military equipment.
2/76 to 5/71	Chief, Electrotechnology Laboratory, MERDC. Responsible for technical planning and direction of scientists, engineers, technicians, and administrators in the conduct of research, applied research, advanced and engineering development, design, and evaluation.

EDUCATION

M.S. in chemical engineering, University of Wisconsin, Milwaukee, 1956.
B.S. in mining engineering, Montana College of Mineral Science and Technology, Butte, Montana, 1947.

AWARDS AND PROFESSIONAL MEMBERSHIPS

Professional Engineer, Wisconsin
American Institute of Chemical Engineers
American Institute of Mining and Metallurgical Engineers

PUBLICATIONS

Several publications in the areas of mining and electrochemical engineering.

KAREN L. BARCLAY — Manager, Socioeconomic Division

Experience includes socioeconomic analysis, environmental studies, alternative energy development, and systems analysis.

EXPERIENCE

1/78 to present	Manager of the Socioeconomic Division of the Montana Energy and MHD Research and Development Institute (MERDI) in Butte, Montana. Responsibilities include supervising research and analyses of economic and sociological data and generating models of existing conditions. Also develops analytical scenarios to describe and analyze the nature of the impacts of proposed actions on existing social and economic conditions.
4/77 to 1/78	Special Assistant on Environmental Affairs for Corporate Development of MERDI. Responsibilities include acting as a liaison between MERDI and public interest groups; coordinating MERDI environmental activities; making recommendations to management on programs and projects of special environmental concern; giving briefings, lectures, and seminars; contacting and consulting with government agencies, private firms, and academic institutions; synthesizing research; and preparing progress reports.
6/76 to 4/77	Environmental Economist with MERDI. Responsibilities included developing a regional dynamic energy system simulation model; developing a Montana comprehensive energy conservation plan, including renewable resource utilization; and conducting a detailed analysis of the environmental, social, and economic constraints involved in siting a major MHD test facility.
9/75 to 6/76	Junior High School Teacher with School District No. 10, Anaconda, Montana. Taught mathematics and social studies.
11/73 to 5/74	Teaching Assistant with the Mathematics Department of Carroll College, Helena, Montana. Assisted with freshman and sophomore advanced algebra and calculus classes.

EDUCATION

B.A. in mathematics (economics minor), Carroll College, Helena, Montana, 1975.

Advanced courses in environmental engineering, Montana College of Mineral Science and Technology, Butte, Montana.

MITRIANN POPOVICH — Research Economist

Areas of expertise include economic research, analyzing and computing economic data, and preparation of reports and articles. Thorough knowledge of business administration, management, finance, and office staff coordination. Demonstrated ability in public relations, communications, marketing, and local and national advertising.

EXPERIENCE

12/77 to present	Research Economist for the Montana Energy and MHD Research and Development Institute in Butte, Montana. Responsible for economic research, analyzing and computing economic data, and preparing reports and proposals in the Socioeconomic Division.
1976 to 1977	Business Manager for three medical offices in Butte, Montana. Responsibilities included the management of all finances, supervision of office staff, coordination of office functions, and preparation of financial statements, quarterly reports, accounts payable, accounts receivable, and payroll.
1974 to 1976	Public Relations Representative of the Gillette Company of North America, Chicago Division. Represented the Gillette Company through mass media communications. Extensive experience with direct communications, interviews, advertising, marketing, television and radio commercials, and public speaking.
1974 to 1975	Assistant Manager for Household Finance Corporation, Butte, Montana. Prepared and analyzed financial information, prepared loans, and interviewed clients. Trained in real estate analysis and collections.
1971 to 1973	Special Assistant to the Director of Butte Senior Citizens Program, Butte, Montana. Extensive public relations work with elderly people. Supervised numerous activities prepared to stimulate communications. Initiated and developed nutritional information and diet plans. Prepared and published articles dealing with nutrition of the elderly.
1970 to 1973	Economic Researcher, Department of Agricultural Economics, Montana State University, Bozeman. Primary responsibilities were to serve as research economist for various economic projects and assist in special programs on enegy models, crop yields, input/output tables, housing, pollution, farm production, and nutritional research. Prepared reports and articles on these and other subjects. Organized library system within the agricultural economics department.

EDUCATION

B.S. in business administration with a three-year economics program, Montana State University, Bozeman, 1974.

Independent studies in business and economics from the Montana College of Mineral Science and Technology, Butte, 1977-78.

PUBLICATIONS

Numerous publications and articles available on request.

FRANKLIN R. SMOYER Engineer II

Areas of expertise include organizational studies, design and analysis of program fiscal management and performance reporting systems, and data processing systems. Broad experience in engineering, management, and public administration.

EXPERIENCE

5/78 to present	Engineer II for the Socioeconomics Division of the Montana Energy and MHD Research and Development Institute, Butte, Montana. Responsible for market analysis and development of marketing and financial plans for regional economic development.
10/77 to 5/78	Engineer Specialist for the Center for Innovation Division of the Montana Energy and MHD Research and Development Institute, Butte, Montana. Responsible for market analysis and development of marketing and financial plans for sponsored projects.
5/73 to 10/77	Special Assistant to the Director, Montana Department of Social and Rehabilitation Services, Helena, Montana. Designed and implemented large-scale data base and teleprocessing systems for program budgeting, control and evaluation.
6/72 to 5/73	Management Analyst for the Governor's Office--Government Operations, Helena, Montana. Performed life cycle cost studies, economic studies, and policy studies. Major area of analysis was social programs and intergovernmental finance.
1/72 to 6/72	Management Consultant for Arthur Young and Company, Seattle, Washington. Performed economic studies and designed systems complying with federal health care regulations and social service.
1971-1972	Power Systems Engineer for the Montana Power Company in Butte, Montana. Performed economic studies of power systems.

EDUCATION

M.B.A., University of Montana, Missoula, 1972.

Graduate work in electrical engineering, University of Florida, Gainesville, 1971.

M.S. in aerospace engineering, U.S. Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio, 1969.

B.S. in physics, Muhlenberg College, Allentown, Pennsylvania, 1964.

PROFESSIONAL MEMBERSHIPS

Beta Sigma Gamma
American Institute of Certified Public Accountants
Montana Society of Certified Public Accountants

PUBLICATIONS

"A Model for the Prediction of Lightning-caused Forest Fires," Frank Smoyer, presented to the Milwaukee Symposium on Automatic Control and Autonomous Computation, 1973.

ELLEN K. THOMAS — Mathematician

Experience in socioeconomic studies and prior experience in drafting.
Primary experience in correlating data gathered in socioeconomic surveys.

EXPERIENCE

2/78 to present	Mathematician for the Engineering Division of the Montana Energy and MHD Research and Development Institute in Butte, Montana. Primary responsibility is working with socioeconomic data gathered in energy use surveys. Has working knowledge of simple computer analysis techniques, including Fortran programming.
5/75 to 9/75	Draftsman's Assistant for the Butte-Silver Bow City-County Planning Board in Butte, Montana. Duties included drafting maps of the Butte area.

EDUCATION

B.S. in economics (science option), Montana State University, Bozeman, Montana, 1977.

MAURICE ROBINETTE

Socioeconomist II

Experience in research methodology, data analysis, and questionnaire design.

EXPERIENCE

8/78 to present	Socioeconomist II for the Montana Energy and MHD Research and Development Institute in Butte, Montana. Primary responsibilities include development of methodological procedures and data analysis for sociological and economic research.
8/77 to 7/78	Research Analyst for the Girls Center, Incorporated in Lewiston, Idaho. Prepared and conducted recreation and delinquency needs assessments for school age girls in Lewiston, Idaho and Clarkston, Washington in a project funded by the Department of Health, Education, and Welfare Title VI Special Projects Grant.
10/76 to 4/77	Research Analyst for the Department of Agricultural Economics at the University of Idaho in Moscow, Idaho. Conducted questionnaires for an erosion attitude survey and analysed a survey on the role of government in Idaho. Prepared a methodology for a state-wide study on attitudes toward welfare and food stamps.
4/76 to 10/76	Social Caseworker II for the Child Development Center, Department of Health and Welfare in Lewiston, Idaho. Duties included data analysis of client characteristics and design of a computerized learning assessment program.
9/73 to 6/75	Research Analyst for Valley Behavioral Research in Clarkston, Washington. Compiled and analyzed state substance abuse plan and designed a video tape treatment technique for alcholic. Analyzed Region II child abuse data.

EDUCATION

M.A. in sociology, University of Idaho, Moscow, Idaho.

B.A. in sociology, Eastern Washington University, Cheney, Washington.

PUBLICATIONS

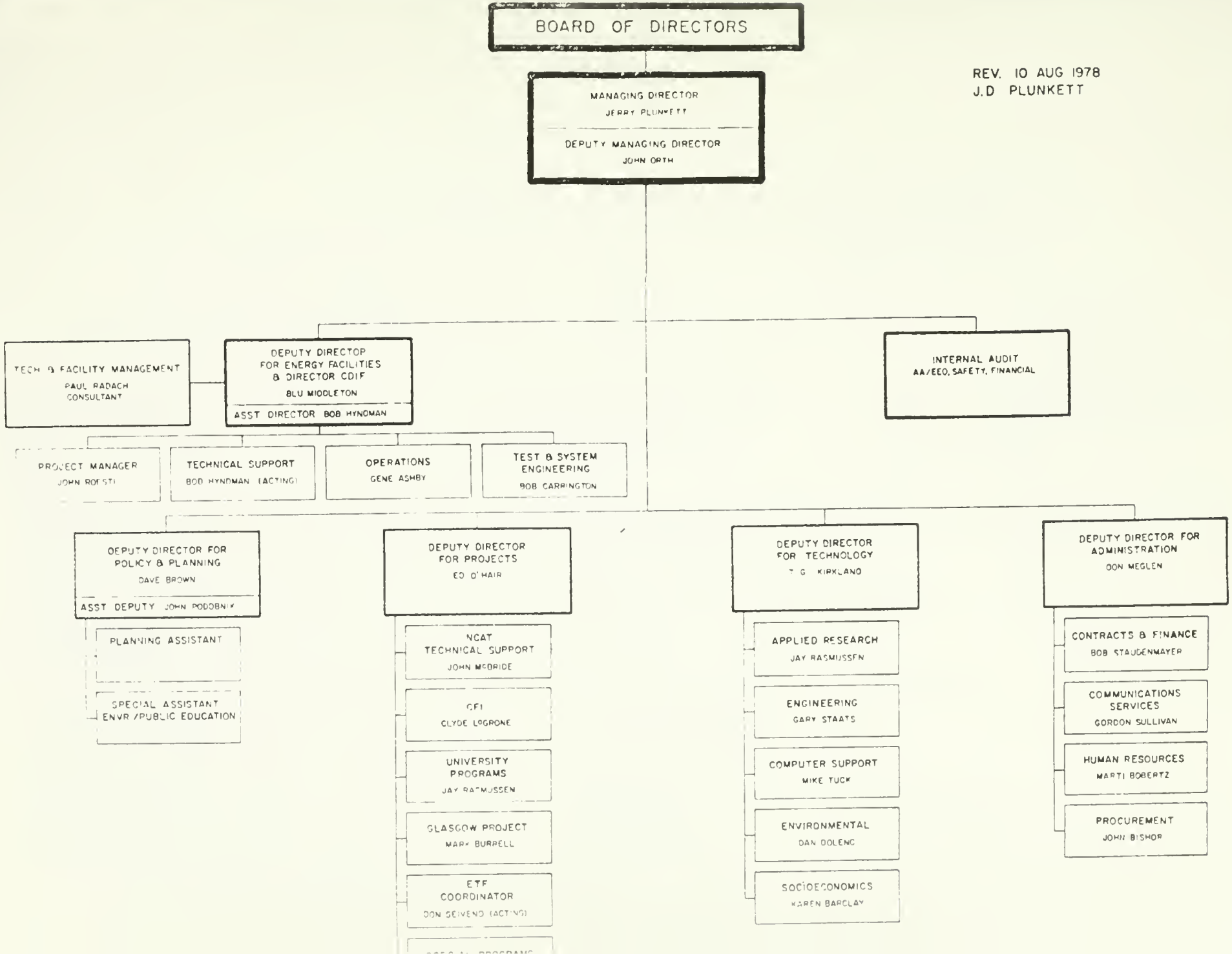
Affects of Religious Affiliation on Innovation: Acceptance of Irrigation Innovations by Rural Mormons and Non-Mormons, University of Idaho Graduate Thesis (unpublished).

APPENDIX

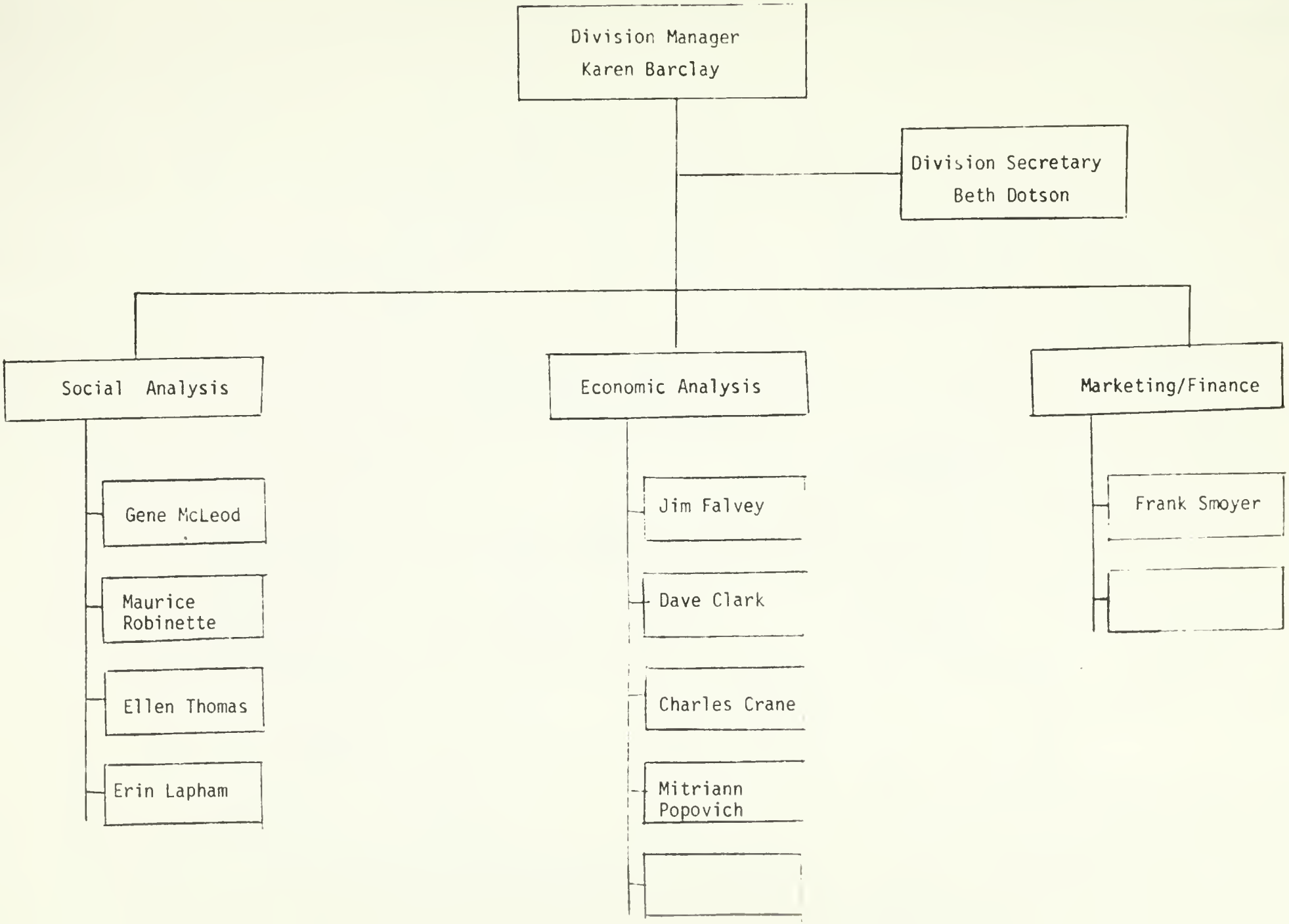
Organizational Charts

THE MONTANA ENERGY & MHD R & D INSTITUTE INC.

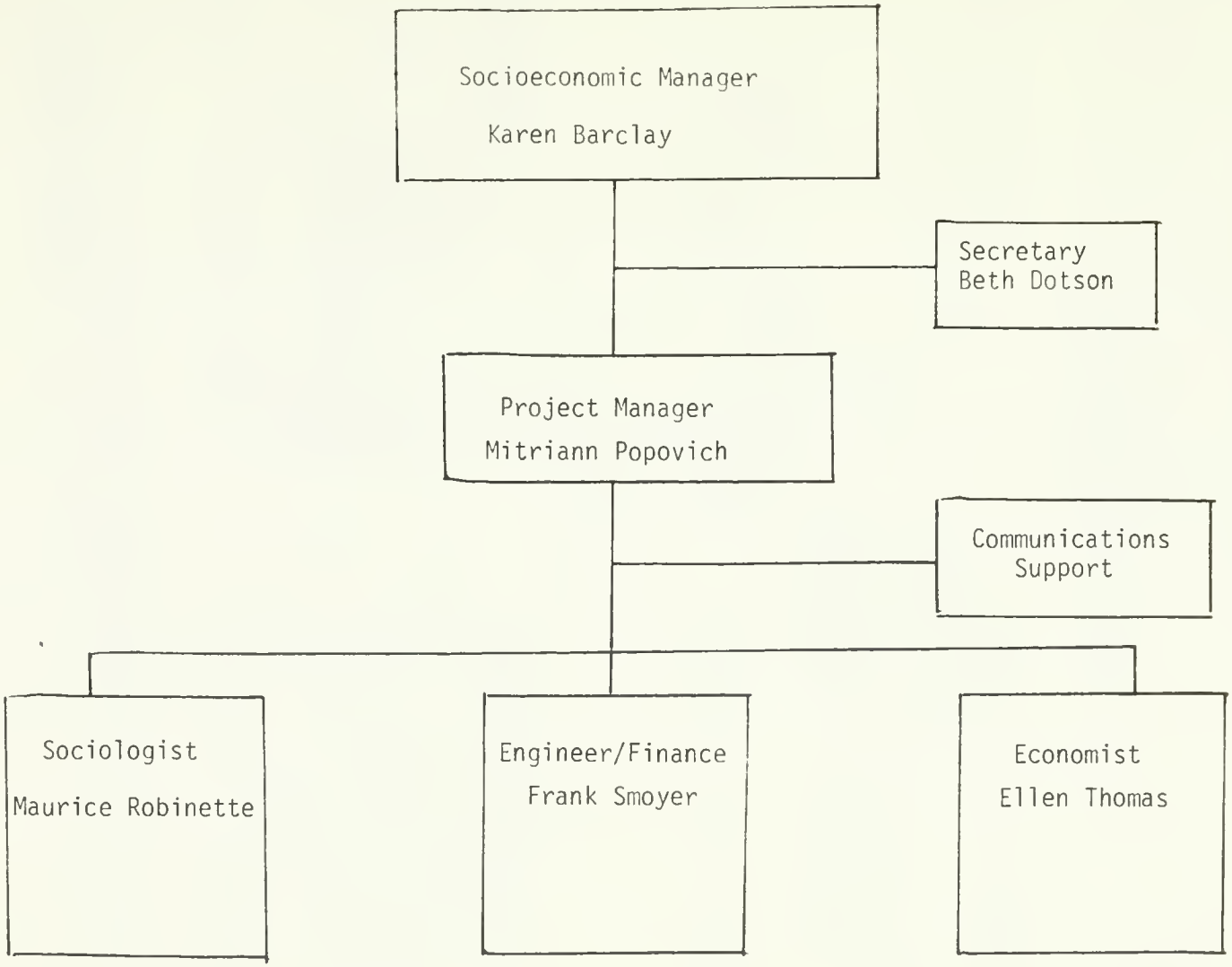
REV. 10 AUG 1978
J.D PLUNKETT



SOCIOECONOMIC DIVISION - 7/12/75



VISUAL PROJECT CHART



COST PROPOSAL

UNDER PROPOSAL SUBMITTED TO

The Montana Department of Natural Resources & Conservation
Helena, Montana

NORTHERN TIER PIPELINE ASSESSMENT

Visual Resource Study

Title

BY

THE MONTANA ENERGY AND MHD RESEARCH AND DEVELOPMENT INSTITUTE, INC.
A Not-for-Profit Corporation
P. O. Box 3809, Butte, Montana 59701

Estimated Cost $ $ 8,072 Proposal Duration 4 months

Name of Principle Investigator Ms. Karen Barclay

Address P. O. Box 3809, Butte, Montana 59701

Phone (406) 494-6246 or FTS 587-6246

Signature Karen L Barclay

Submission Date 9/12/78 Proposal Valid Until 11/1/78

ENDORSEMENTS

Official Authorized to Obligate Proposal

Name: R. E. Staudenmayer

Title: Mgr., Contracts & Finance Div.

Signature:

Date: 9/12/78

Telephone No. (406) 494-6217

Official Authorized to Negotiate for Proposer

Name: R. D. Snodgrass

Title: Supervisor, Contracts/Property

Signature:

Date: 9/12/78

Telephone No. (406) 494-6295

NOTE: Indirect rates submitted in this proposal are provisional and subject to upward or downward adjustment throughout the Fiscal year dependent upon outcome of audits.

MERDI

COST ESTIMATE

RFP or Project Title
Northern Tier Pipeline - Visual Resource Study Plan

RFP No.

LABOR CATEGORY	RATES	HOURS	AMOUNT	TOTAL $
ENG/SCI III*	11.96	32	383	383
ENG/SCI I	7.91	300	2,373	2,373
Communications Supt.	5.90	48	285	285
Secretarial	5.57	48	267	267
Total Est. Hours		428		
Total Direct Labor			3,306	3,306
Fringe Benefits	35%		1,157	1,157
Subtotal			4,463	4,463
Overhead	38%		1,696	1,696
Travel (Trans)			892	892
Subtotal			7,051	7,051
G&A Expense	8%		564	564
Total Est. Cost			7,615	7,615
Fee	6%		457	457
Total Cost Plus Fee			8,072	8,072

*Manager, Socioeconomic Division

Prepared by

Approved by

NORTHERN TIER PIPELINE

VISUAL RESOURCE STUDY PLAN

Travel

Trips	Days	People	Destination	Transportation
4	4	1	Helena	$92
Estimated costs for travel to various locations of proposed pump stations (if required)				$800
			TOTAL TRAVEL	$892